PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
PAGANO ET AL.	Examiner: Sharmila S. Gollamudi
Application No.: 09/843,000	Group Art Unit: 1616
Filed: April 26, 2001	Confirmation No.: 7885
For: NAIL ENAMEL COMPOSITIONS, RELATED METHODS AND A TWO COMPONENT KIT FOR PAINTING THE NAILS	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

Sir:

I, Anjali Patil, a citizen of the United States, and a resident of Westfield, New Jersey, hereby declare that:

1. I am a co-inventor of the above-mentioned patent application.

2. I have a Ph.D. in polymer chemistry, obtained from the Indian Institute of Technology in Bombay, India, in 1982. I have been employed by Revlon since 1992, conducting research and development in cosmetic products containing novel polymers. Prior to my experience at Revlon, I worked for certain companies and universities in the development of new polymers and the study of polymeric structures.

3. Under my direction and control three different compositions were prepared according to Example 6 of U.S. Patent No. 3,991,007 (Perronin et al.). In the first composition (Formula 1), a copolymer comprised of 90 parts methyl methacrylate and 10 parts acrylic acid (90/10 MMA/AA) as taught in Example 6 of Perronin et al. was used. In the second composition (Formula 2), the 90/10 MMA/AA copolymer of Perronin et al. was replaced with a copolymer comprised of 90 parts butyl methacrylate and 10 parts acrylic acid (90/10 BMA/AA). In the third composition (Formula 3), the 90/10 MMA/AA copolymer of Perronin et al. was replaced with a copolymer comprised of 95 parts butyl methacrylate and 5 parts acrylic acid (95/5 BMA/AA). The BMA/AA copolymers correspond to the copolymers of the subject application. The tested compositions are as set forth below in Table 1.

Table 1

Material	Formula 1	Formula 2	Formula 3
Nitrocellulose Resin	7.9%	7.9%	7.9%
Butyl Acetate	7.9%	7.9%	7.9%
Ethyl Acetate	38.8%	38.8%	38.8%
Butanol	4.1%	4.1%	4.1%
Isopropanol	28.7%	28.7%	28.7%
Butyl Phthalate	5.2%	5.2%	5.2%
Pigment	3.7%	3.7%	3.7%
MMA/AA (90/10)	3.7%	-	-
BMA/AA (90/10)	-	3.7%	-
BMA/AA (95/5)	-	-	3.7%

As described below, these compositions were tested using two tests commonly used to test the integrity and properties of nail enamel films.

Paints and Varnishes -- Pendulum Damping Test -ANS/ISO 1522 – 1998(E)

In this test, a pendulum resting on a coating surface is oscillated and the time for the oscillation amplitude to decrease by a specific amount is measured. The shorter the damping time, the lower the hardness of the film. A copy of this test method is attached hereto as Exhibit A.

To measure the hardness of each of the three Formulas described above, a 6 mil wet film of each of the three compositions was drawn down on separate glass plates. The resulting films were evaluated for film hardness over a period of 7 days using a pendulum hardness tester equipped with a König Pendulum (see Section 5.1.1 of the test method). Readings were taken at elapsed time intervals of 1 hour, 2 hours, 4 hours, 24 hours, and 7 days after the films were drawn down. For example, for Formula 1, at 1 hour after film draw down, the König pendulum tester was activated according to Section 5.1.1 in the test method. The amount of time required for the pendulum to deflect from 6° to 3° was noted. As can be seen below, for Formula 1, which is the composition of Perronin et al., the time for the pendulum to deflect from 6° to 3° was 59 seconds. The results of the readings are presented below in Table 2. In the table, at each time interval after the film draw down, the time it took the pendulum to deflect from an initial angle of 6° to a final angle of 3° is noted. This time period was detected by means of an automatic counter equipped with light barriers. In this test, the longer it takes for the pendulum to deflect from 6° to 3°, the harder the film. Thus, a lower time period indicates a softer film. In commercial nail enamel compositions, films that are too hard will be brittle, and will crack and chip very readily.

As can be seen below in Table 2, the film of the composition disclosed in Example 6 of Perronin et al. (Formula 1 with a 90/10 MMA/AA copolymer) had a significantly higher reading at each time interval. Thus, the film of Formula 1 was harder than the films of Formulas 2 and 3 at each time interval. The results of this test demonstrate that the films utilizing the BMA/AA copolymer of the subject application were softer than the film of Example 6 of Perronin et al.

Table 2

Elapsed Time	Formula 1 MMA/AA (90/10)	Formula 2 BMA/AA (90/10)	Formula 3 BMA/AA (95/5)
1h	59 sec	49 sec	44 sec
2h	64 sec	52 sec	49 sec
4h	74 sec	57 sec	57 sec
24h	76 sec	57 sec	50 sec
7 Days	69 sec	53 sec	53 sec

Mandrel Flex Test (Modification of ASTM D 522-93a)

The conducted Mandrel Flex Test was a modification ASTM D 522-93a method. A copy of the ASTM method is attached hereto as Exhibit B. Our modifications made the test more suitable for use in ascertaining the commercial acceptability of nail enamel films.

For each composition described in Table 1, a 3 mil wet film was drawn down on a sheet metal plate having a thickness of 0.3 mm. After 24 hours, the plates were placed on a 1/8" cylindrical mandrel and were then bent approximately 180° around the mandrel as set forth in the test method. The resulting plate was then bent back to a flat orientation. The plate again was placed on the same diameter mandrel in the same area of the film and bent 180° again. This process of bending/flattening was repeated 10 times.

After 3 days the bend test was repeated again over the 1/8" mandrel in the same area of the film previously tested, then the plate was flattened out. After being flattened, the MMA/AA composition (Example 6 of Perronin et al. (Formula 1)) showed cracking and tears in the region that had been bent over the mandrel. The cracking and tears demonstrated that the film was not commercially acceptable for use in a nail enamel. With respect to the BMA/AA compositions (Formulas 2 and 3), both the 90/10 BMA/AA film and the 95/5 BMA/AA film remained undamaged, with no cracks or other imperfections. These results indicate that the films of Formulas 2 and 3 -- that is, the films of the subject application -- would be commercially acceptable for use in a nail enamel.

Conclusion

The results of the Pendulum Damping Test and the Mandrel Flex test demonstrate that copolymers comprised of BMA/AA are surprisingly better suited for use in nail enamels than are copolymers comprised of MMA/AA. Accordingly, the copolymers of the subject application are surprisingly better than the copolymer disclosed in Example 6 of Perronin et al.

4. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

October 19, 2016
Date

Anjali Abhimanyu Patil
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